
NASA-16705 (APRIL 2001)
NATIONAL AERONAUTICS NASA - KSC
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DIVISION 16 - ELECTRICAL

SECTION 16705

TIMING AND COUNTDOWN SYSTEM

04/01

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SECTION 16705

TIMING AND COUNTDOWN SYSTEM 04/01

NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers the requirements for the timing and countdown systems. Accordingly, this section should be tailored carefully to suit project conditions and to meet project requirements.

PART 1 GENERAL

1.1 SUMMARY

NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.

1.2 GENERAL REQUIREMENTS

NOTE: Review submittal description (SD) definitions in Section 01300, "Submittals," and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.

Section 16003, "General Electrical Provisions" applies to work specified in this section.

Raceways shall be in accordance with Section 16145, "Standard Wiring

Systems".

1.3 SUBMITTALS

The following shall be submitted in accordance with section describing "Submittals," in sufficient detail to show full compliance with the specification:

SD-03 Product Data

Manufacturer's Catalog Data shall be submitted for the following items:

Cable
Terminal Cabinet
Outlet Boxes

SD-11 Closeout Submittals

Provide (1/8" - 1'-0")1:100 scale drawings to indicate installed locations for building entrance terminal cabinets and timing device outlet rough-in locations. Drawings shall be computer generated on size "F" sheets, using CAD software. Provide one hard copy, and one electronic copy in ".DXF," "DWG" or "DGN" format. Indicate locations of the following equipment/components:

Terminal Cabinet
Timing Device Outlet Locations

1.4 QUALIFICATIONS

The manufacturer shall be a company specializing in the manufacture of products specified in this section for a minimum of 3 years.

1.5 DELIVERY, HANDLING, AND STORAGE

All equipment/material shall be delivered, stored, handled, and installed in a manner that will not damage the equipment. Equipment/material shall be stored indoors in the original unbroken, unopened containers bearing manufacturer's name, brand and UL label, in a clean, dry, and ventilated location.

During installation, equipment/material shall be protected from the weather.

1.6 ENVIRONMENT

Hardware is designed to function within a controlled interior environment under the following temperature and humidity conditions:

- a. Temperature: 60 degrees F+/-15 degrees C to 80 degrees F+27 degrees C with extremes of uncontrolled temperature of 52 degrees F +10 degrees C to 105 degrees F+40 degrees C for a maximum of 1 hour.

- b. Humidity: Nominal 55 percent with a range of 45 to 70 percent within the above defined temperature range.

1.7 SYSTEM DESCRIPTION

The Timing and Countdown system signals generated by a central GPS timing system, are distributed throughout the center to digital output devices at selected locations, for use as a synchronized base of reference for time. The signals are designed to be transmitted through a system of distribution amplifiers and are supported on multi-pair communications cables throughout the center. Upon entry into a building, the signals reside on a premise distribution system based on copper coax cable, to each timing output device.

Work under this section includes all raceways, junction boxes, outlet boxes, terminal cabinets, and cabling. All hardware (including clock instruments), will be provided and installed by the Contracting Officer, and all cabling will be terminated and tested by the Contracting Officer.

PART 2 PRODUCTS

2.1 MATERIALS

General:

- a. New and approved by Underwriters Laboratories, Inc.
- b. Where 2 or more units of same class of equipment or materials are required, provide all units from single manufacturer.

2.1.1 Cable

Timing system cable shall be NEC Type CL2P plenum rated coaxial cable, with #20AWG, stranded core conductor with a nominal impedance of 50 ohms. Insulation shall be foam FEP with a nominal O.D. of 2.6mm102 inches, shield shall be 100% bifoil with 95% tinned copper braid. Jacket shall be black, flexible, plenum rated composite.

2.1.2 Terminal Cabinet

Timing and Countdown terminal cabinet shall be a NEMA 12 rated formed aluminum cabinet, 36 inches914 mm x 36 inches914 mm x 8 inches203 mm, with fully hinged door and locking handle. A removable flame retardant plywood back-panel, painted grey with non-flammable paint shall be provided in the cabinet for mounting terminal strips.

2.1.3 Outlet Boxes

Outlet boxes for rough-in at timing output device locations shall be 4-11/16 inches119 mm square x 2-1/8 inch54 mm deep, formed, hot-dipped galvanized steel electrical rough-in boxes, with single or double gang trim rings depending on the outlet requirements.

2.1.4 Identification Labels

2.1.4.1 Equipment

Labels shall be laminated plastic with black background and engraved white lettering in accordance with Section 16003, "General Electrical Provisions". Permanently attach identification labels to front of electrical apparatus using stainless steel sheet metal screws.

2.1.4.2 Cables

Cable labels shall be a polyimide coated nylon cloth with a permanent acrylic pressure sensitive adhesive and a topcoat suitable for laser or write-on printing. Material shall offer solvent and smudge resistance.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 General

Install all equipment/components in accordance with manufacturer's instructions.

Provide raceway system under provisions of Section 16145, "Standard Wiring Systems" of specification.

3.1.2 Raceways

Riser cables shall be routed between floors in conduit sleeves through the slab, properly sealed to provide for fire separation as required. Horizontal cabling shall exit the communications equipment room or closet from the terminal cabinet in 2 inch conduit routed out to the telecommunications cable tray in the ceiling space of the respective floor.

Cables shall be routed on cable tray to each of the outlet box locations located throughout the space.

A 25mm1 inch conduit shall be provided from the cable tray down to each outlet box. Conduit runs shall contain no more than three 90 degree bends.

Conduit in finished spaces shall be routed concealed in stud wall partitions.

3.1.3 Terminal Boxes

Terminal boxes shall be located in the building's main telecommunications equipment room and as necessary in intermediate telecommunication rooms on multi-floor buildings. Boxes shall be mounted to plywood backboards, securely fastened to masonry or stud partition walls. Mount boxes plumb and square so that the hinge door operates freely with no binding or warping.

3.1.4 Rough-In Boxes

Rough-in boxes for timing device outlet locations shall be securely

fastened to the building structure. Do not support boxes from conduit. Outlet boxes in finished spaces shall be mounted recessed in stud wall partitions and provided with a single-gang trim ring, mounted vertically. Provide a single-gang blank trim plate over the opening that matches wiring device trim plates in the space. In unfinished spaces, surface mount outlet boxes in locations indicated on the drawings. Provide a metal blank cover for all boxes.

3.1.5 Cable

Cable shall be installed in accordance with manufacturer's instructions. Where routed on cable tray, neatly bundle and strap to rungs in a workmanlike manner, using nylon cable ties or approved wraps. In terminal boxes and outlet boxes, neatly coil and secure slack cable for future termination by the Contracting Officer. In terminal boxes, allow a minimum of 6 foot1.8 m slack, and in outlet box locations, provide 3 foot1 m of slack for future termination. Timing system cabling shall be separated from all audio cabling, and power conductors, by a minimum of 300mm12". At the completion of installation, all cables shall be rung out for continuity and labeled as indicated herein.

3.2 LABELING

3.7.1 Cabinets

Identify apparatus by specified name; for example "Timing and Countdown System Cabinet No. 1".

3.2.2 Cabling

All cables shall be labeled at each end with the zone or room number.

3.3 CLEANING AND PROTECTION

Prior to final acceptance, clean system components and protect from damage and deterioration.

-- End of Section --